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schools in the last fifteen years. It is significant that the latest article on physical geography included in the volume originally appeared in 1902 and that the article given first prominence in the volume, and dated 1906, gives less emphasis to physical geography and more to the wider outlook on geography from an educational standpoint that is constantly becoming more prominent in theory and practice.

The larger portion of the volume is devoted to the physiographic essays, several of which in their original appearance were epoch making and now classic standards. In order of appearance, and this order is roughly a history of the development of the physiography of the lands as a science, we have *The Rivers and Valleys of Pennsylvania* (1889); *The Rivers of Northern New Jersey*, with notes on the Classification of Rivers in General (1890); *Plains of Marine and Sub-Aërial Denudation* (1896); *The Seine, The Meuse, and The Moselle* (1896); *The Geographical Cycle* (1899); and *The Peneplain* (1899), followed by several others up to 1906. Those listed above, however, represent the several steps in the development of the modern accepted theory of land development and are basal in any study of the subject.

The volume is attractively printed, conveniently indexed and presented in a form worthy of the cause and the author.

R. E. DODGE.

**Geschichte der Erde und des Lebens.** Von Johannes Walter, o. ö., Professor der Geologie und Palaeontologie an der Universität Halle. iv and 570 pp., and 355 Illustrations. Veit & Co., Leipzig, 1908. M. 14.

Persons who suspect geology of being a dry study ought to read this book. While the lay reader will find it fascinating, the scientist is compelled to admire the wonderful simplicity, clearness and unity of this presentation of our present knowledge of the beginnings and history of the globe, based upon the combined results of the earth sciences in the widest meaning of the term. A book like this is not a handbook proper nor a mere reference work however rich in references it actually is; it is a recreation of the matter itself through the scientific and artistic genius of its author.

In some aspects it reminds one of Suess's "Face of the Earth," without being so romantic; it restricts itself to what we, nowadays, accept as facts but arranges them in any way which leads thought beyond them. Little can be said about such a book in the way of introduction or criticism.

Its thirty chapters deal with (1) the properties of the earth; (2) geological forces; (3) the place of the earth in the solar system; (4) the formation of the moon and meteorites; (5) the formation, and subsequent changes, of the earth's crust; (6) the world ocean; (7) organic life; (8) atmosphere and climate; (9) the eruptive processes of the deep; (10) volcanism; (11) the development of earth history; (12) geological chronology; (13) the lower limit of the occurrence of fossils; (14) the traces of an Algonkian period; (15) the Cambrian; (16) halcyon days of animal development in the Silurian; (17) the old red Northland; (18) the Devonian Ocean; (19) the "Productus" seas; (20) the folding of the earth's crust and the formation of coal; (21) Godwanaland; (22) the Triassic seas; (23) the struggle of the northern desert with the Triassic seas; (24) the Jurassic seas; (25) the development of reptiles in North America; (26) the Cretaceous period and the great sway of death; (27) the Tertiary period;

(28) the Diluvial snow age; (29) prehistoric man; and (30) the course of the history of the earth.

This mere list of chapter heads is in itself an illustration of how far the trend of thought, and the interpretations of the author deviate from the old grooves of the traditional "course in geology." It is impossible in a short review to do justice to the many original points in the author's treatment of the various subjects. A few of the most interesting ones can only be mentioned.

I should like to draw special attention to the instructive way in which the thermo-plastic origin of the metamorphic rocks is explained as well as the formation of granites as a "cup of cinders" of the magma in which the basic components have sunk to the bottom—things which have been said before but hardly ever in a way comparable to the author's. Other chapters deserve the attention of the American student because the opinions expressed in them have not yet, to my knowledge, been adduced in American geological literature. Thus, for instance, the author's suggestion that rapid and frequent changes of facies in certain formations may be explained, not by as many oscillations of sea level, but rather by changes in the salinity of the respective seas, or by changes of the ocean currents which resulted in the transport and deposition of different deposits. The triassic sandstones, Professor Walther claims to be, for Germany at least, the product of a sand desert with shallow temporary lakes and pools, with short interludes of marine transgression, and a final overflowing by the *Muschelkalk* and *Keuper* seas. His arguments, too, in favor of a snow age in the place of the accepted ice age are worthy of notice.

As to the geological forces that produced the changes of the different periods, the author is as little an advocate of catastrophal theories as of perfect quietism. He says that, while on the whole, evolution went its way quietly through the different chapters of the earth's history, there must have been quasi "heroic" epochs, now and then, in which the action of geological and evolutionary factors was accelerated, not by the increased activity of one of them but by the accidental, simultaneity of several series of causes whose effects not only added to, but also intensified, each other. Thus we see, at various times, that certain groups of plants or animals now one, now another, receive a certain impetus of a kind not now discernible to us, and begin to blossom out, as it were, into a profusion of both individuals and species. From the ontogenetic point of view, such periods of intensified vitality have an analogy, for example, in the life of the insect when, after long weeks and months of larval existence, it suddenly evolves into the butterfly. As normal phases in the development of species, these sudden climaxes should be called, not catastrophes, but anastrophes, and to discover the causes of this biological phenomenon the author designates as the paramount task of the geology of the future. He even hints at the possibility that the beginnings of life itself might be explained with the aid of a great anastrophe through which the indifferent initial forms suddenly developed new types, the ancestors of the living species of later ages.

The book, as has been said before, will be found full of interest for almost any reader; the layman will enjoy it as an epic of natural history; the novice in geology will prize it as one of the clearest expositions, from great points of view, of the problems of his chosen field; the mature student who has worked his way through the grind of the regular text book, will find it a new revelation on what he thought he knew, and the scholar and teacher will pay their respects to the

author who has shown what can be made of this subject by a master hand: It may not be amiss to say that no one with a tolerable reading acquaintance with scientific German need shrink from it for fear of linguistic difficulties. It is as readable as if it were a popular book, which I do not hesitate to set down as one of its merits. An extensive bibliography at the end of each chapter, an alphabetic index and three hundred and fifty-three illustrations of all kinds also facilitate its use.

MARTHA KRUG GENTHE.

**A Transformed Colony.** Sierra Leona as it was, and as it is, its Progress, Peoples, Native Customs and Undeveloped Wealth. By T. J. Alldridge. xvi and 368 pp., 66 Illustrations, Map and Index. The J. B. Lippincott Company, Philadelphia, 1910. \$3.50.

Mr. Alldridge was, for many years, a British official in the Crown Colony of Sierra Leone. He is still the only man who has ever travelled around the entire area of what is now the Protectorate. In this interesting and authoritative book, he has pictured the past of Sierra Leone, as it really was; and then he tells of the wonderful transformation that has been brought about, the larger part of it within the past twelve years.

This book is representative of a new variety of works that is now being added to the literature on Africa. Four or five of these books have, thus far, appeared, and they could not have been written until this time. They contrast the former state of things with the present changed conditions. They sum up, thus far, the results of the mighty efforts that the white race has put forth to begin the regeneration of Africa and make the continent more useful to its peoples and to the world.

No part of barbarous Africa more strikingly illustrates the progressive movement than Sierra Leone. Mr. Alldridge shows how that region has been transformed from a lawless and slave-dealing country into one of security and freedom. The reign of terror has passed away. The chiefs no longer exercise autocratic power over life and death. The entire Hinterland is embraced in the Protectorate. An excellent railroad has helped to bring a region nearly as large as the State of New York under complete official control. Hospitals are multiplying, the elements of civilization, as we understand it, are taking root and the government policy is to teach the natives "the Gospel of the Carpenter Shop," as Bishop Ingham calls it. We cannot read such chapters as those describing the government school at Bo, the Sierra Leone R.R., the revolution in trade, the Princess Christian Hospital, and others, without believing that the new order of things is a wonderful boon to the million or two of natives in Sierra Leone. The book is well illustrated and contains an unusually good map of the Protectorate, considering that it can be only approximately accurate, as detailed surveys are still lacking.

**Adrift on an Ice-Pan.** By Wilfred Thomason Grenfell. xxvi and 69 pp., and Illustrations. Houghton Mifflin Company, Boston and New York, 1909. \$0.75, net.

This is Dr. Grenfell's story of his drift on an ice floe that had broken away from land when he was sledge-travelling on a mission of mercy. He was alone with eight dogs, on an unsettled coast and his situation, for many hours, seemed hopeless. Relief came at last, but not till three of the dogs had given their lives